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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,406	09/28/2006	Ronaldus Maria Aarts	NL 040326	8423
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EXAMINER				
ELBIN, JESSE A				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/599,406

Applicant(s)

AARTS ET AL.

Examiner

JESSE A. ELBIN

Art Unit

2614

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S508)
Paper No(s)/Mail Date 18 April 2007.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application.
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "enclosure...comprising two or more transducers" of claim 10 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-2, 5-7, 9, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Hoefler et al. (US Patent 6,771,787 ('787)).

Regarding claim 1, Hoefler teaches an enclosure (waveguide; Fig. 5a #14a) for an acoustic transducer (#10), the enclosure comprising a first chamber (cavity; Fig. 5a *surrounding* #10) for accommodating the acoustic transducer and a second chamber (Fig. 5a #18₂), which first and second chambers are acoustically coupled by a coupling section (Fig. 5a #18₁), wherein the first chamber and the second chamber are spaced apart (Fig. 5a).

Regarding claim 2, Hoefler remains as applied above.

Hoefler further teaches the coupling section (Fig. 5a #18₁) having a smaller cross section (Fig. 5a 'A₁') than the first chamber (Fig. 5a *surrounding* #10) and/or the second chamber (Fig. 5a #18₂).

Regarding claim 5, Hoefler remains as applied above.

Hoefler further teaches a third chamber (Fig. 5a #18₄) which is acoustically coupled with the first chamber (Fig. 5a *surrounding* #10) or the second chamber (Fig. 5a #18₂) by a further coupling section (Fig. 5a #18₃).

Regarding claim 6, Hoefler remains as applied above.

Hoefler further teaches the further coupling section (Fig. 5a #18₃) having a smaller diameter (Fig. 5a 'A₃') than the first chamber (Fig. 5a *surrounding* #10), the second chamber (Fig. 5a #18₂) and/or the third chamber (Fig. 5a #18₄).

Regarding claim 7, Hoefler remains as applied above.

Hoefler further teaches the first chamber (Fig. 5a *surrounding* #10), the second chamber (Fig. 5a #18₂) and the third chamber (Fig. 5a #18₄) constitute a three-dimensional arrangement (Fig. 5a *illustrates a waveguide with length, height, and a cross-sectional area (depth)*).

Regarding claim 9, Hoefler remains as applied above.

Hoefler further teaches the transducer (Fig. 5a #10) being located at an outer surface of the first chamber (Fig. 5a).

Regarding claim 11, Hoefler remains as applied above.

Hoefler further teaches an audio system (acoustic waveguide loudspeaker system; col. 1 lines 13-14), comprising at least one acoustic transducer (fig. 5a #10) accommodated in an enclosure (waveguide; Fig. 5a #14a) according to claim 1.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 3-4, 8, 12-14, and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoefler et al. (US Patent 6,771,787 ('787)) as applied to claim 1 above.

Regarding claim 3, Hoefler remains as applied above.

Hoeffler does not explicitly teach further teaches the enclosure being dimensioned so as to constitute a second-order acoustic system.

Hoeffler does explicitly teach, as an alternate design, that "[w]aveguide 14 may be closed ended" ('787 col. 3lines 9-10). One of ordinary skill in the art would recognize that a closed ended acoustic enclosure inherently serves as a second-order acoustic system. The acoustic system is modeled by a spring (compliance of the air within the enclosure) in combination with a mass (mass of the moving components of the speaker). Sealed enclosures provide the benefit of improving sound quality by reducing resonant peaks output from the enclosure.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the waveguide as taught by Hoeffler by closing the ends of the waveguide (taught by Hoeffler as a design variation) to allow it to function as a sealed box for the benefit of improving sound quality by reducing the resonant peaks of the enclosure.

Regarding claim 4, Hoeffler remains as applied above.

See rejection of claim 3 above, where Hoeffler teaches that "Waveguide 14 may be closed ended" '787 col. 3lines 9-10).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the waveguide as taught by Hoeffler by closing the ends of the waveguide (taught by Hoeffler as a design variation) to allow it to function as a sealed

box for the benefit of improving sound quality by reducing the resonant peaks of the enclosure.

Regarding claim 8, Hoefler remains as applied above.

Hoefler does not explicitly teach the second chamber having a longitudinal direction which is substantially perpendicular to a longitudinal direction of the first chamber.

Examiner takes official notice that one of ordinary skill in the art, at the time of the invention would, with a minimal amount of experimentation, know to position the second chamber, such that the longitudinal direction would be substantially perpendicular to the longitudinal direction of the first chamber. Hoefler explicitly teaches "the waveguide may be curved to be a desired shape, to fit into an enclosure, or to position one end of the waveguide relative to the other end of the waveguide" (col. 3 lines 18-20).

It would have been obvious to one of ordinary skill in the art at the time of the invention to, based on the teachings of Hoefler, and the requirements of the design of a particular enclosure, in which the waveguide is to be placed, to position the second chamber, such that the longitudinal direction would be substantially perpendicular to the longitudinal direction of the first chamber for the benefit of fitting the waveguide into an existing enclosure volume.

Regarding claim 12, Hoefler remains as applied above.

Hoeffler does not explicitly teach an amplifier for providing an excitation signal to the at least one transducer, and preferably a signal source such as a tuner, a CD player, a DVD player, an MP3 player, a microphone and/or a computer.

Examiner takes official notice that connection of the speaker system as taught by Hoeffler to an amplifier and a signal source is well known in the art. Speaker systems must be connected to a signal source, with common sources including those to reproduce music, video, or gaming sound (i.e. CD, DVD, MP3 player, or computer sources). Other common uses for speakers include those used to broadcast live sound or public address systems (i.e. connection to a microphone). All speaker systems connected to a CD, DVD, MP3, computer, or microphone sources require an amplifier to boost the signal level to a loudness appropriate for a particular listening situation.

It would have been obvious to one of ordinary skill in the art at the time of the invention to connect the speaker system taught by Hoeffler to a commonly used amplifier and signal source for the benefit of driving the speaker system with a signal level appropriate to produce a loudness appropriate for a particular listening situation.

Regarding claim 13, Hoeffler remains as applied above.

Hoeffler further teaches the transducer being arranged ("In the waveguide may be a small amount of acoustically absorbing material 13...placed near the transducer 10; col. 3 lines 42-45) for operating in a frequency range chosen so as to exclude any higher resonance frequencies of the acoustic system constituted by the transducer and the enclosure ("The small amount of acoustically absorbing material damps undesirable

resonances and provides a smoother output over the range of frequencies radiated by the waveguide but does not prevent the formation of low frequency standing waves in the waveguide"; col. 3 lines 49-53).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include damping material near the transducer as suggested by Hoefler, in the loudspeaker system taught by Hoefler to damp undesired resonances of the system without preventing low-frequency standing waves in the waveguide.

Regarding claim 14, Hoefler remains as applied above.

Hoefler does not explicitly teach the transducer being arranged for operating at the fundamental resonance frequency of the acoustic system constituted by the transducer and the enclosure.

Examiner takes official notice that matching a particular transducer with a designed enclosure is well known in the art. A loudspeaker tuned to operate at a resonance frequency equal (or substantially equal) to the resonance frequency of the enclosure will yield the highest efficiency of the system. Since a high efficiency system results in louder sounds with less power delivered to the speaker, one of ordinary skill in the art, at the time of the invention, would be motivated to match the resonances of the two components.

It would have been obvious to one of ordinary skill in the art at the time of the invention to match a transducer's and enclosure's resonance frequencies to increase the efficiency of the system for the benefit of reducing the power required of the system.

Regarding claim 15, Hoefler remains as applied above.

Hoefler does not explicitly teach a television set, comprising at least one acoustic transducer accommodated in an enclosure according to claim 1.

Examiner takes official notice that incorporating the loudspeaker system as taught by Hoefler into a television set is well within the skill level of one of ordinary skill in the art, at the time of the invention. Hoefler teaches curving the waveguide to any desired shape, in order to fit it into an enclosure (col. 3 lines 18-20). As television sets generally require sound output to accompany images being displayed, one of ordinary skill in the art, with a minimal amount of experimentation, would be able to curve the waveguide taught by Hoefler to fit into a television set (enclosure) in order to attain a tuned waveguide in an existing volume.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the loudspeaker system as taught by Hoefler with a television set for the benefit of increasing the fidelity and efficiency of the sound, output from the television set without altering the television set's enclosure.

Regarding claim 16, Hoefler remains as applied above.

Hoefler does not explicitly teach a monitor, comprising an enclosure according to claim 1 and provided with an acoustic transducer.

See rejection of claim 15 above, where Hoefler teaches curving the waveguide to be a desired shape, to fit into an enclosure (col. 3 lines 18-20). A [computer] monitor

frequently requires sound to accompany images being displayed, similar to a television set, as described in the rejection of claim 15 above.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the loudspeaker system as taught by Hoeffler with a monitor for the benefit of increasing the fidelity and efficiency of the sound, output from the monitor without altering the monitor's enclosure.

7. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hoeffler et al. (US Patent 6,771,787 ('787)) as applied to claim 1 above, and further in view of Taddeo (US Patent 4,276,446 ('446)).

Regarding claim 10, Hoeffler remains as applied above.

Hoeffler does not explicitly teach the enclosure comprising two or more transducers.

In the same field of endeavor, Taddeo teaches an acoustic transducer system wherein multiple driven speakers are included in respective chambers ('446 Fig. 1) for the benefit of creating multiple chamber/speaker combination, each tuned to a different frequency band.

It would have been obvious to one of ordinary skill in the art at the time of the invention to include a tuned waveguide as taught by Hoeffler in combination with a second chamber/speaker combination as taught by Taddeo for the benefit of creating a transducer system tuned to multiple frequency bands.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Yoshida et al, (US Patent 4,926,487) teaches a speaker system tuned to low frequencies incorporated into a television cabinet.
- b. Parker et al. (US PGPub 2005/0205348) teaches acoustic waveguiding with multiple transducers.
- c. Morkerken (US PGPub 2004/0173402) teaches a sound transmitter and speaker.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSE A. ELBIN whose telephone number is (571)270-3710. The examiner can normally be reached on Monday through Friday, 9:00am to 6:00pm EDT.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz can be reached on (571) 272-7499. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. A. E./
Examiner, Art Unit 2614
/CURTIS KUNTZ/
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